

PATENT SPECIFICATION

(11) 1 546 903

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(54) RAIL VEHICLE FOR TRANSPORTING HEAVY LOADS

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many, a German Body Corporate, do hereby
5 declare the invention for which we pray that
a patent may be granted to us, and the
method by which it is to be performed, to
be particularly described in and by the
10 following statement:—

The invention relates to a rail vehicle for
transporting heavy loads of the kind com-
prising two bogies, a body disposed between
the bogies and slides pivoted to the body and
15 slidable in a lateral direction in guides on the
bogies in response to travel of the vehicle in
a curve.

The pivotal connections between the body
and the slides constitute outer control points
20 which serve for transfer of loads to the bogies
from the body. In practice the slides are
generally disposed at the centres of the bogies.
In order to reduce, when traversing a curve,
the resultant movement which may be con-
siderable due to the length of the vehicle,
25 inner control points have been provided. These
inner control points are constituted by other
articulated connections between the bogies and
the body which are disposed between the
slides and the centre of the body.

The invention provides a rail vehicle for
transporting heavy loads comprising two
bogies, a load supporting body disposed be-
tween the bogies, slides pivoted to the body
35 and guided for substantially horizontal lateral
movement in guides on the bogies in response
to travel of the vehicle in a curve, stops on
the bogies for limiting the lateral movement
of the slides in both directions, and centering
40 means on each bogie for imparting lateral
centering forces to opposite sides of the body
at a location between the associated slide and
the centre of the body, the body being mov-
able out of engagement with the centering
45 means at one side of the body in response
to increase in the curvature of the track in
excess of that at which the stops become
operative.

The centering forces may be applied to
the body by springs or by pneumatic or
hydro-pneumatic actuators.

Certain embodiments of rail vehicle accord-
ing to the invention are illustrated sche-
matically in the drawings, in which:—

Figs. 1a to 1d are plan views of the first
embodiment, showing it in four different
positions;

Fig. 2 is a corresponding side view;

Figs. 3 and 4 are plan views on a larger
scale corresponding to Figs. 1a and 1b of a
bogie in another embodiment of the vehicle;

Fig. 5 shows the bogie illustrated in Fig.
3 in the position assumed by the parts upon
lateral displacement of the load; and

Fig. 6 is a plan view of a bogie in another
embodiment of vehicle.

The vehicle shown in Figs. 1a to 1d and
Fig. 2 includes a load-carrying body 2 carry-
ing outriggers 1 which support the body on
bogies 3 and 4. The outer ends of the out-
riggers 1, i.e. the ends remote from the
body, are connected to respective bearing
sockets 9, 10 disposed at the mid-points of
slides 5 and 6, which are horizontally dis-
placeable in guides 7 and 8 in the bogies 3
and 4. The centres of the sockets 9 and 10
constitute outer control points A. Pre-stressed
springs 11 apply lateral centering forces to
the outriggers 1 at inner control points I,
which normally occupy central positions on
the bogies. As the centering forces should
desirably be equal to or greater than the
maximum possible counter-force arising from
canting due to rail camber, the pre-tension
of the springs is adjustable. The springs 11
should also have a level characteristic.

Fig. 1a shows the position of the vehicle
during straight travel; Figs. 1b to 1d show
different positions assumed by the bogies in
response to progressively increasing curvature
of the track. It will be seen that in Fig. 1b
the inner control points I have retained their
central positions while the outer control points
A have moved towards the outer side of the
curve in the track. In Fig. 1c the outer con-
trol points A have reached outermost posi-

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tions in which they have been arrested by stops 12 on the bogies. As will be seen from Fig. 1d, upon further increase in the curvature in the track the springs 11 at the inner side of the curve shorten and allow the control points I to move to the inner side of the curve while the outer control points A remain in their outer end positions. No action on the part of the crew during travel is therefore required. The springs 11 at the outer side of the curve are arrested by stops 13 in their most extended positions.

In the bogie 3 shown in Figs. 3—5 the springs 11 are replaced by pairs of hydro-pneumatic actuators, each consisting of an accumulator 15 and a hydraulic cylinder 16 connected thereto. The pistons of the cylinder are connected to eyes 17 on respective levers 18 which are pivoted at one end to the bogie. The stops 13 are not operative in the straight travel condition shown in Fig. 3. The lateral stops 20 for the slide 5 are adjustable.

Fig. 5 shows the maximum permissible lateral displacement of the load on the body during straight travel. This is accompanied by operation of a displacement device (not shown) to shift the slide 5 to move to a corresponding lateral position. Such lateral displacements can be effected during travel of the vehicle which is advantageous. After termination of the lateral displacement, the displacing device is disengaged from the slide, and the load is returned to its normal central position by the hydraulic cylinders 16.

The bogie 3 shown in Fig. 6 has a slide 5' which is positioned in an arcuate guide 7' and the levers 18' have a common pivot 21. This has the advantage that, when the pivot 21 is suitably disposed, the movement of the inner control point I on the outrigger 1 with respect to the levers 18' is extremely small. Naturally in practice there is not the line contact shown between the point I and the levers 18' but a surface contact, e.g. by means of a sliding block.

WHAT WE CLAIM IS:—

1. A rail vehicle for transporting heavy loads comprising two bogies, a load supporting body disposed between the bogies, slides pivoted to the body and guided for substantially horizontal lateral movement in guides on the bogies in response to travel of the vehicle in a curve, stops on the bogies for

limiting the lateral movement of the slides in both directions, and centering means on each bogie for imparting lateral centering forces to opposite sides of the body at a location between the associated slide and the centre of the body, the body being movable out of engagement with the centering means at one side of the body in response to increase in the curvature of the track in excess of that at which the stops become operative.

2. A vehicle according to claim 1, in which the lateral centering forces are applied to the body by springs.

3. A vehicle according to claim 1, in which the lateral centering forces are applied to the body by pneumatic or hydro-pneumatic actuators.

4. A vehicle according to any one of the preceding claims, in which the body carries outriggers projecting from its opposite ends, the slides being pivoted to the projecting ends of the outriggers and the centering means acting on the outriggers.

5. A vehicle according to any one of the preceding claims, in which the centering forces applied to the body are equal to or greater than the maximum possible counterforce arising from canting due to cambered rails.

6. A vehicle according to any one of the preceding claims, which include further stops which coact with the centering means when the body moves out of engagement with them.

7. A vehicle according to any one of the preceding claims, in which the stops for limiting lateral movement of the slides in the guides are adjustable.

8. A vehicle according to claim 1, substantially as described herein with reference to Figs. 1a—1d and 2 of the accompanying drawings.

9. A vehicle according to claim 1, substantially as described herein with reference to Figs. 3, 4 and 5 of the accompanying drawings.

10. A vehicle according to claim 1, substantially as described herein with reference to Fig. 6 of the accompanying drawings.

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COMPLETE SPECIFICATION

3 SHEETS

This drawing is a reproduction of
the Original on a reduced scale
Sheet 1

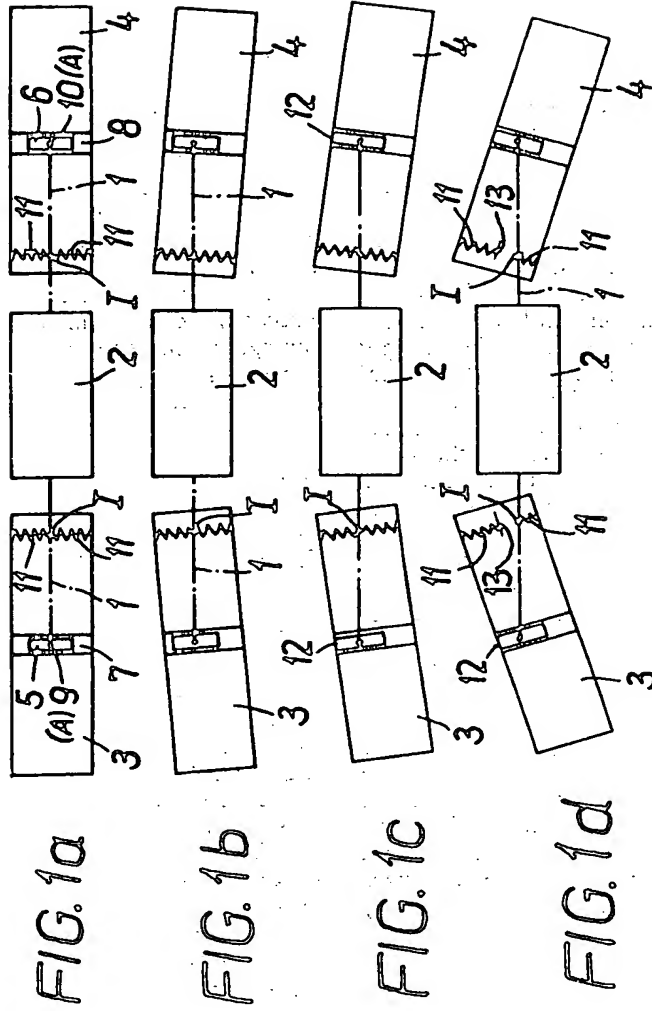
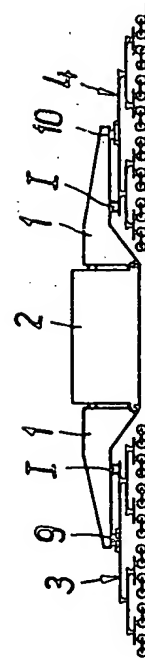


FIG. 2



1. The first part of the document is a list of names and addresses of the members of the committee. The names are listed in alphabetical order, and the addresses are given below each name. The list is as follows:

Name	Address
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Mr. E. F. G.	1717 Twelfth St., New York, N. Y.
Mr. H. I. J.	1818 Fourteenth St., New York, N. Y.
Mr. K. L. M.	1919 Sixteenth St., New York, N. Y.
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Mr. Q. R. S.	2121 Twentieth St., New York, N. Y.
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Mr. Z. A. B.	2424 Twenty-sixth St., New York, N. Y.
Mr. C. D. E.	2525 Twenty-eighth St., New York, N. Y.
Mr. F. G. H.	2626 Thirtieth St., New York, N. Y.
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Mr. L. M. N.	2828 Thirty-fourth St., New York, N. Y.
Mr. O. P. Q.	2929 Thirty-sixth St., New York, N. Y.
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Mr. P. Q. R.	3838 Fifty-fourth St., New York, N. Y.
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Mr. V. W. X.	4040 Fifty-eighth St., New York, N. Y.
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Mr. E. F. G.	4343 Sixty-fourth St., New York, N. Y.
Mr. H. I. J.	4444 Sixty-sixth St., New York, N. Y.
Mr. K. L. M.	4545 Sixty-eighth St., New York, N. Y.
Mr. N. O. P.	4646 Seventieth St., New York, N. Y.
Mr. Q. R. S.	4747 Seventy-second St., New York, N. Y.
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Mr. W. X. Y.	4949 Seventy-sixth St., New York, N. Y.
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Mr. U. V. W.	5757 Ninety-second St., New York, N. Y.
Mr. X. Y. Z.	5858 Ninety-fourth St., New York, N. Y.
Mr. A. B. C.	5959 Ninety-sixth St., New York, N. Y.
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Mr. J. K. L.	6262 One Hundred Second St., New York, N. Y.
Mr. M. N. O.	6363 One Hundred Fourth St., New York, N. Y.
Mr. P. Q. R.	6464 One Hundred Sixth St., New York, N. Y.
Mr. S. T. U.	6565 One Hundred Eighth St., New York, N. Y.
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Mr. R. S. T.	8282 One Hundred Forty-second St., New York, N. Y.
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Mr. X. Y. Z.	8484 One Hundred Forty-sixth St., New York, N. Y.
Mr. A. B. C.	8585 One Hundred Forty-eighth St., New York, N. Y.
Mr. D. E. F.	8686 One Hundred Fiftieth St., New York, N. Y.
Mr. G. H. I.	8787 One Hundred Fifty-second St., New York, N. Y.
Mr. J. K. L.	8888 One Hundred Fifty-fourth St., New York, N. Y.
Mr. M. N. O.	8989 One Hundred Fifty-sixth St., New York, N. Y.
Mr. P. Q. R.	9090 One Hundred Fifty-eighth St., New York, N. Y.
Mr. S. T. U.	9191 One Hundred Sixtieth St., New York, N. Y.
Mr. V. W. X.	9292 One Hundred Sixty-second St., New York, N. Y.
Mr. Y. Z. A.	9393 One Hundred Sixty-fourth St., New York, N. Y.
Mr. B. C. D.	9494 One Hundred Sixty-sixth St., New York, N. Y.
Mr. E. F. G.	9595 One Hundred Sixty-eighth St., New York, N. Y.
Mr. H. I. J.	9696 One Hundred Seventieth St., New York, N. Y.
Mr. K. L. M.	9797 One Hundred Seventy-second St., New York, N. Y.
Mr. N. O. P.	9898 One Hundred Seventy-fourth St., New York, N. Y.
Mr. Q. R. S.	9999 One Hundred Seventy-sixth St., New York, N. Y.
Mr. T. U. V.	10000 One Hundred Seventy-eighth St., New York, N. Y.

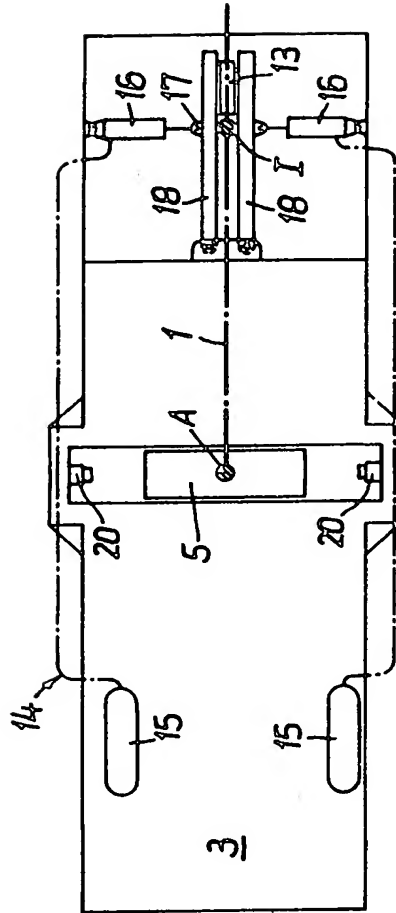


FIG. 3

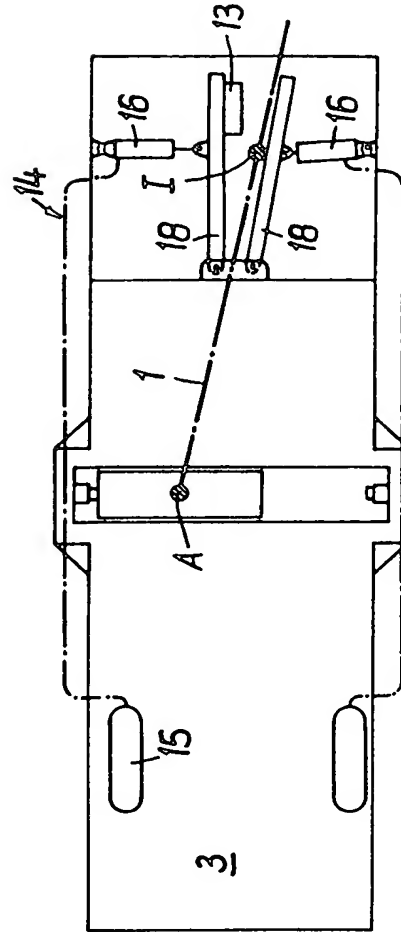


FIG. 4



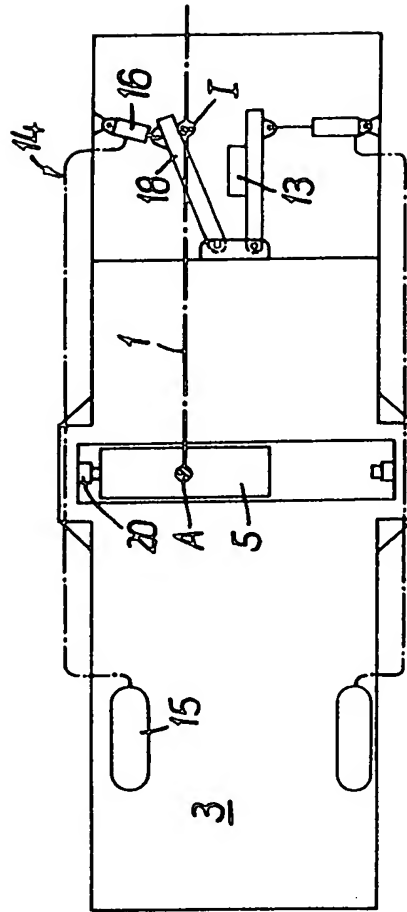


FIG. 5

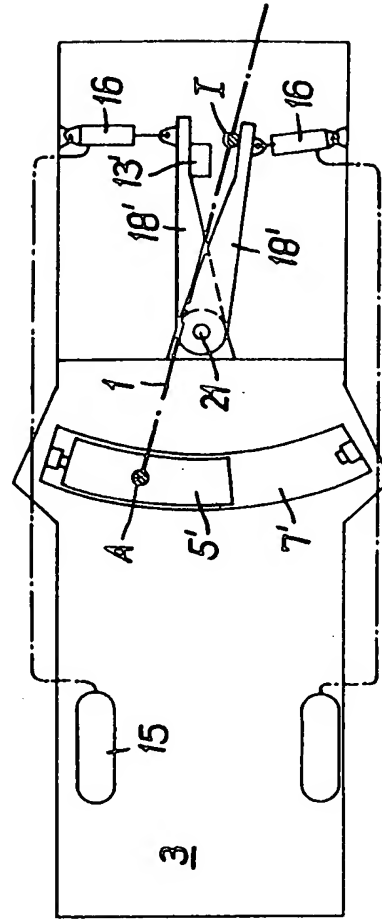


FIG. 6

